



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,280	11/21/2003	Yuanning Chen	TI-35022.1	3187
23494	7590	05/20/2004	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			CHEN, JACK S J	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/719,280

Applicant(s)

CHEN ET AL.

Examiner

Jack Chen

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3 and 8-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3 and 8-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/21/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### **DETAILED ACTION**

In response to the communication filed on November 21, 2003 through December 12, 2003, claims 3, 8-11 are active in this application.

#### ***Information Disclosure Statement***

The information disclosure statement filed on November 21, 2003 has been considered.

#### ***Oath/Declaration***

Oath/Declaration filed on November 21, 2003 has been considered.

#### ***Specification***

The abstract of the disclosure is objected to because the numerical references/characters should be in parentheses. Correction is required. See MPEP § 608.01(b).

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

#### ***Claim Objections***

Claim 3 is objected to for depending from canceled claim 1. For the purposes of patentability, claim 3 will be construed as having all of the limitations of the canceled claim 1. Claim 3 must be presented in independent form. Appropriate correction is required.

Claim 8 is objected to for depending from canceled claim 5. For the purposes of patentability, claim 8 will be construed as having all of the limitations of the canceled claim 5.

Claim 8 must be presented in independent form. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 3, 8-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsuchiya et al. "Femto-Second CMOS Technology with High-K Offset Spacer and SiN Gate Dielectric with Oxygen-enriched Interface".

Tsuchiya et al. disclose a CMOS transistor (which includes both **PMOS** and **NMOS**) having a cap layer comprised of a high dielectric constant material (i.e., the offset spacer, abstract section, fig. 1), see page 1, and figs. 1-14 for more details.

3. Claims 3, 8-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu et al., U.S./6,504,214 B1.

Yu et al. disclose a PMOS transistor (figs. 1 and 3D; col. 2, lines 27-48) having a cap layer (in this case, the layer 34 is considered as the cap layer; i.e., the substrate capped with layer 34) comprised of a high dielectric constant material (i.e., hafnium silicon oxynitride, see table 1), see figs. 1-3D, cols. 1-10 for more details.

Art Unit: 2813

4. Claims 3, 8-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Xiang et al., U.S./6,657,267 B1.

Xiang et al. disclose a PMOS transistor (figs. 1 and 3C; col. 2, lines 52-67) having a cap layer 44 comprised of a high dielectric constant material (i.e., hafnium silicon oxynitride; col. 6, table 1), see figs. 1-3C, cols. 1-10 for more details.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al. in view of Yu et al., U.S./6,646,307 B1.

Art Unit: 2813

Tsuchiya et al. disclosed in above paragraph 2 and in particular using any high-k material for the offset spacer; however, Tsuchiya et al. is silent to using hafnium silicon oxynitride as the high-k material.

Yu et al. teach a semiconductor device having hafnium silicon oxynitride as the high-k dielectric material, see table 1. See figs. 1-3F, and cols. 1-12 for more details.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use hafnium silicon oxynitride for the high-k dielectric as taught by Yu et al. in the device of Tsuchiya et al. in order to improve the drive currents of the device.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Chen whose telephone number is (571)272-1689. The examiner can normally be reached on Monday-Friday (9:00am-6:30pm) alternate Monday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W Whitehead can be reached on (571)272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2813

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jack Chen  
Primary Examiner  
Art Unit 2813